
The Asilinae (Diptera, Asilidae) of Oklahoma

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The robber flies or assassin flies form a conspicuous segment of the dipterous fauna of Oklahoma. The relation of robber flies to other insects is comparable to that of *Accipiter* hawks to other birds. The adults are noted for their speed, agility, and predaceous feeding habits. At rest they habitually sit on leaves, stems, or the bare ground ready to pursue flying insects, large or small. Some are known to take larvae of the Lepidoptera (Comstock, 1940), while others are cannibalistic (Hull, 1962). In some genera, the adults mimic certain wasps and bees in appearance and sound produced; therefore, they are often confused with these forms. When disturbed, the adults usually fly a short distance and alight facing the disturber. The larvae are found in the soil and in decaying wood where they prey on other larvae, or possibly at times are scavengers (Hull, 1962).

The apparent color of the flies is largely due to fine microscopic pollinose hairs often called dust. Adults in collections often become "greasy," however, and the ground color and pollinose hairs on the body are obscured. Placing pinned specimens in benzene or xylene for about a week usually restores the color and pollinosity.

The previous works found for Oklahoma were those of R. D. Bird, a collector who is acknowledged by Curran (1931) as securing many fine specimens in Oklahoma, and of A. Earl Pritchard, who described two new species in the subfamily Asilinae, *Proctacanthella jamesi* (= *exquisita*) and *Promachus oklahomensis* (Pritchard, 1935), and added many state collection records.

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The taxa are arranged after Martin and Wilcox (1965). Synonymy is omitted, for it can be found in the above work. For descriptions of the taxa see Schaefer (1962).

KEY TO NEARCTIC SUBFAMILIES

- 1. Palpi one-jointed2
- Palpi two-jointed3
- 2. Marginal cell openLeptogastrinae
- Marginal cell closed and petiolated before reaching
costaAsilinae
- 3. Marginal cell openDasypogoninae
- Marginal cell closed and petiolated before reaching
costaLaphrinae

THE SUBFAMILY ASILINAE

Characteristics: *Mystax* (bristles between oral margin and antennae) usually well developed, third antennal joint with slender terminal style composed of two joints, basal joint small and indistinct, distal joint usually long and bristle-like; maxillary palpi one-jointed; marginal cell closed and petiolated before costa, two or three submarginal cells; tarsal pulvilli present, empodia bristle-like; genitalia external, ovipositor sometimes with circlet of spines; hypopygium of male consists of elongated, longitudinally divided halves, the upper and lower forceps. The upper forceps (gonoforceps or claspers) are characteristic of the male of some genera. The proctiger appears as a flap or projection between the upper forceps.

KEY TO GENERA OF OKLAHOMA

- 1. Antennal style bare2
- Antennal style pectinate*Ommathus*
- 2. Tarsal claws thick almost to apices; abdomen broad3
- Tarsal claws tapered to apices; abdomen narrow4
- 3. Face strongly gibbous below, not uniformly pilose;
- length 15 mm or more*Mallophora*
- Face evenly and gently convex, evenly pilose;
- length 14 mm or less*Mallophortina*

4. Three submarginal cells (very long sectional crossvein formed between veins R₂₊₃ and R₄)5
Two submarginal cells6
5. Furcation of veins R₁ and R₂ before apex of discal cell, first submarginal cell without shadow*Efferia*
(in part).
Furcation of veins R₁ and R₂ beyond apex of discal cell first submarginal cell with shadow*Promachus*
6. Vein R₁ meeting costa before apex7
Vein R₁ meeting costa behind apex8
7. Furcation of veins R₁ and R₂ not angulated at base nor bearing a stump*Proctacanthus*
Furcation of veins R₁ and R₂ angulated at base and/or bearing a stump*Efferia*
(in part)
8. Metanotal slopes (below scutellum) bare*Proctacanthella*
Metanotal slopes hairy9
9. Abdomen with bristles laterally before segmental apices10
Abdomen without bristles beyond first segment*Asilus* (in part)
10. Ovipositor of female without apical spines; male genitalia compact, never leaving a large open space on apical half11
Ovipositor of female armed at apex with short, stout spines; forceps of male genitalia strongly curved and leaving a large open space on apical half as seen from above*Philonicus*
11. Occipital bristles strongly proclinate on upper two thirds or so; dorsum of thorax with two rows of well developed bristles, one far exceeding length of others*Neoitamus*
Occipital bristles proclinate only slightly on upper half and appearing nearly straight; no long dorsal thoracic bristles12
12. Face with a strongly produced gibbosity occupying the lower half or more, developed rather abruptly dorsally13
Face with a weak gibbosity confined to lower half or less, not developed abruptly dorsally*Asilus* (in part)
13. Wings with unrestricted clouded areas at the apices and along posterior margins*Tolmerus*
Wings with clouded areas at apices and along posterior margins, restricted to the cell center and surrounded by a hyaline area*Machimus*

Ommatius Wiedemann

Ommatius tibialis Say — County records: Alfalfa, Craig, Delaware, Latimer, McCurtain, Nowata, Pawnee, Payne, and Washington.

Mallophora Macquart

Mallophora orcina (Wiedemann) — *M. orcina* mimics the bumble bee worker *Bombus americanus* (Fabricius) (Bromley, 1950). County records: Alfalfa, Cleveland, Latimer, Lincoln, Osage, and Payne.

Mallophorina Curran

- 1. Posterior femora with long black hairs and yellow pile below; posterior tibiae black-haired on whole length dorsally, at least some black reaching base *acra*
 Posterior femora with only yellow pile below; posterior tibiae white-haired dorsally *guildiana*

Mallophorina acra (Curran) — County records: Alfalfa, Beaver, Canadian, Choctaw, Cleveland, Ellis, Harper, Jefferson, Kiowa, McCurtain, Oklahoma, Payne, Roger Mills, Rogers, Texas, Woods, and Woodward. Paratypes are present in the Stovall Museum, University of Oklahoma.

Mallophorina guildiana (Williston) — County record: Cimarron.

Efferia Coquillett

- 1. Ovipositor conical; upper forceps of male genitalia divided at apices (Fig. 22) *interrupta*
 Ovipositor laterally compressed; upper forceps not as above 2
- 2. Ovipositor divided at tip (as seen from above); proctiger of male genitalia divided (Figs. 5 and 6) 3
 Ovipositor not divided at tip; proctiger of male genitalia not divided 4
- 3. Wings hyaline *bicaudata*
 Wings infuscated *pogonias*
- 4. Furcation of veins R₁ and R₂ distinctly before base of second posterior cell 5
 Furcation of veins R₁ and R₂ opposite or beyond base of second posterior cell 15
- 5. Three submarginal cells (very long sectorial crossvein formed between veins R₂, and R₄) *canidula*
 Two submarginal cells 6
- 6. Furcation of veins R₁ and R₂ at or before middle of distance between base of second posterior cell and r-m crossvein 7
 Furcation of veins R₁ and R₂ distinctly beyond middle of distance between base of second posterior cell and r-m crossvein 12
- 7. Femora black anteriorly, red posteriorly *varipes*
 Femora black 8
- 8. Mystax white 9
 Mystax entirely or largely yellow 10
- 9. Thorax dorsally dark brownish-gray *argentiifrons*
 Thorax dorsally yellow-brown *argyroscoma*
- 10. Upper occipital bristles yellow *bezarensis*
 Upper occipital bristles black 11
- 11. Palpal bristles largely black *texana*
 Palpal bristles white *pallidula*
- 12. Palpi yellow-haired 13
 Palpi largely black-haired *nemoralle*
- 13. Wings hyaline; tibiae basally yellow; occipital bristles yellow *auriptila*
 Wings slightly clouded; tibiae basally red; upper occipital bristles black 14

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| 14. Frontal bristles yellow; scutellar bristles black | <i>plena</i> |
| Frontal bristles largely black; scutellar bristles black and yellow | <i>prairiensis</i> |
| 15. Vein R ₁ curved backward at tip, meeting costa at or behind apex of wing | 16 |
| Vein R ₁ curved forward, plainly meeting costa before apex of wing | 19 |
| 16. Mystax black and white to pale yellow | 17 |
| Mystax entirely yellow | <i>aurimystacea</i> |
| 17. Tibiae largely bright yellow | 18 |
| Tibiae reddish-brown; mystax black and white | <i>aestuans</i> |
| 18. Mesonotum, scutellum posteriorly with some pale bristles; mystax black and pale yellow | <i>kansensis</i> |
| Mesonotum, scutellum bristles all black; mystax black and white | <i>belfragei</i> |
| 19. Scutellum conspicuously haired and with numerous marginal bristles | <i>snowi</i> |
| Scutellum with short hairs and usually not more than six marginal bristles | 20 |
| 20. Palpi black-haired; male and ventral protuberances on abdominal segments four, five, and six | <i>tuberculata</i> |
| Palpi largely white or yellow; male not as above | 21 |
| 21. Abdominal segments dorsally with dark spots or bands | 22 |
| Abdominal segments with pale yellow-gray hairs | <i>leucocoma</i> |
| 22. Abdominal segments each with black and gray band of subequal width | <i>zonata</i> |
| Abdominal segments each with two large, dark, rounded spots, where black appears continuous, gray posterior margin much smaller than black | <i>albibarbis</i> |

Efferia interrupta (Macquart) (Fig. 22) — County records: Alfalfa, Caddo, Canadian, Choctaw, Cimarron, Cleveland, Coal, Comanche, Craig, Ellis, Jackson, Latimer, Lincoln, Logan, McCurtain, McIntosh, Major, Murray, Oklahoma, Okmulgee, Osage, Pawnee, Payne, Pushmataha, and Woods.

Efferia candida Coquillett (Fig. 14) — County record: Beaver.

Efferia bicaudata (Hine) (Fig. 6 and 5) — County records: Alfalfa, Beaver, Cleveland, Harper, and Murray.

Efferia pogonias (Wiedemann) — County record: Cleveland.

Efferia argentiifrons (Hine) (Fig. 19) — County records: Adair, Cimarron, Craig, Delaware, and Texas.

Efferia argyrosoma (Hine) (Fig. 15) — County record: Cimarron.

Efferia auripila (Hine) (Fig. 13) — County records: Comanche and Harper.

Efferia bezarensis (Bromley) (Fig. 17) — County record: Kiowa.

Efferia nemoralis (Hine) (Fig. 9) — County records: Craig, McCurtain, and Nowata.

Efferia pallidula (Hine) — County record: Cimarron.

Efferia plena (Hine) (Fig. 8) — County record: Greer.

Efferia prairiensis (Bromley) (Fig. 10) — County records: Cleveland and Pittsburg.

Efferia texana (Banks) (Fig. 11) — County records: Adair, Alfalfa, Carter, Cleveland, Comanche, Delaware, Haskell, Latimer, McCurtain, Mayes, Murray, and Pittsburg.

Efferia varipes (Williston) (Fig. 7) — County record: Cimarron.

Efferia aestuans (Linnaeus) (Fig. 18) — Distribution statewide.

Efferia aurimystacea (Hine) (Fig. 26) — Reported by Hine (1919) from Clark County, Kansas.

Efferia belfragei (Hine) (Fig. 20) — County record: Murray.

Efferia kansensis (Hine) (Fig. 24) — County records: Alfalfa, Beaver, Cimarron, Comanche, Grady, Harmon, Harper, Noble, Payne, Tillman, Woods, and Woodward.

Efferia snowi (Hine) (Fig. 16) — County records: Alfalfa, Caddo, Carter, Cleveland, Comanche, Harper, Latimer, McCurtain, Murray, Oklahoma, and Woods.

Efferia tuberculata (Coquillett) (Fig. 23) — County records: Blaine, Cimarron, Cotton, Ellis, Murray, Texas, and Woodward.

Efferia albibarbis (Macquart) (Fig. 21) — County records: Adair, Alfalfa, Beaver, Caddo, Cimarron, Cleveland, Comanche, Dewey, Ellis, Harmon, Harper, Jackson, Kiowa, LeFlore, Logan, Marshall, Murray, Okfuskee, Oklahoma, Osage, Pawnee, Payne, Roger Mills, Sequoyah, Teaxs, Woods, and Woodward.

Efferia leucocoma (Williston) (Fig. 12) — County records: Alfalfa, Cimarron, Cleveland, Comanche, and Woods.

Efferia zonata (Hine) (Fig. 25) — County record: Cimarron.

Promachus Loew

1. Abdominal segments distinctly banded, black and gray, subequal in width 2
 Abdominal segments not banded 3
2. Thorax reddish-brown; femora red *hinei*
 Thorax yellowish-gray; femora dark *vertebratus*
3. Abdomen largely pale 4
 Abdomen largely black with pale hairs noticeable on segments two to five on sides and apical margins *bastardii*
4. Thorax clothed with yellowish-brown pollinosity 5
 Thorax grayish-yellow *oklahomensis*
5. Gray shadow in first submarginal cell wider than marginal cell; male genitalia longer than abdominal segments six and seven *fitchii*
 Gray shadow in first submarginal cell distinctly narrower than marginal cell; male genitalia shorter than abdominal segments six and seven *texanus*

Promachus bastardii (Macquart) — County records: Adair, Bryan, Carter, Cleveland, Comanche, Craig, Custer, Delaware, Harper, Kay, Lati-

mer, LeFlore, Love, McCurtain, McIntosh, Mayes, Nowata, Oklahoma, Osage, Payne, Rogers, Sequoyah, and Washington.

Promachus fitchii Osten Sacken — County records: Alfalfa, Beaver, Craig, LeFlore, Nowata, and Payne.

Promachus hinei Bromley — County records: Cleveland, Comanche, Delaware, Kay, Latimer, LeFlore, McCurtain, Osage, Pawnee, Payne, Sequoyah, and Washington.

Promachus oklahomensis Pritchard — County records: Cimarron and Greer.

Promachus texanus Bromley — County record: Cimarron.

Promachus vertebratus Say — County records: Ellis, Grant, Osage, Texas, and Woodward.

Proctacanthus Macquart

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| 1. Abdomen red; proboscis apically triangular | 2 |
| Abdomen gray; proboscis apically dorso | |
| ventrally flattened | 3 |
| 2. Thoracic dorsum uniformly dark red | <i>hinei</i> |
| Thoracic dorsum dark red with dark vittae | <i>rufus</i> |
| 3. Proboscis with dorsally enlarged ridge | 4 |
| Proboscis uniform, without enlarged ridge | 6 |
| 4. Mystax usually pale yellow; male genitalia | |
| compact | 5 |
| Mystax white; forceps of male genitalia | |
| elongated, curved at tips, enclosing open space | |
| beyond proctiger | <i>nearno</i> |
| 5. Abdomen with stubby black bristles (larger than | |
| recumbent white hairs) on most segments, at | |
| least on two to four | <i>micans</i> |
| Abdomen with a few long black bristles, no | |
| stubby ones | <i>milbertii</i> |
| 6. Palpi white; wings hyaline | 7 |
| Palpi black; wings brown | <i>brevipennis</i> |
| 7. Femora black above, dark red below, or all | |
| dark red | <i>rodecki</i> |
| Femora light red above, black below | <i>duryi</i> |

Proctacanthus brevipennis (Wiedemann) — County records: Alfalfa, Cleveland, Craig, Kiowa, and Latimer.

Proctacanthus duryi Hine — County records: Alfalfa, Beaver, Blaine, Cleveland, Ellis, Harper, Jefferson, Logan, McCurtain, McIntosh, Major, Noble, Okfuskee, Oklahoma, Okmulgee, Osage, Texas, Woods, and Woodward.

Proctacanthus hinei Bromley — County records: Alfalfa, Beaver, Blaine, Cleveland, Ellis, Harper, Jefferson, Logan, McCurtain, McIntosh, Major, Noble, Okfuskee, Oklahoma, Okmulgee, Osage, Texas, Woods, and Woodward.

Proctacanthus micans Schiner — County records: Alfalfa, Cimarron, and Woods.

Proctacanthus milbertii Macquart — County records: Alfalfa, Beaver, Canadian, Cleveland, Ellis, Grant, Harper, Haskell, Major, Murray, Noble, Osage, Pawnee, Payne, and Texas.

Proctacanthus nearno Martin — County record: Cimarron.

Proctacanthus rodecki James — County records: Alfalfa, Beaver, Caddo, Choctaw, Cimarron, Cleveland, Ellis, Harper, Kiowa, Payne, Texas, and Tillman.

Proctacanthus rufus Williston — County records: Alfalfa, Cimarron, Ellis, Major, Osage, Texas, and Woodward.

Proctacanthella Bromley

1. Abdomen with contrasting mid-dorsal row of dark spots; male genitalia with posteriorly directed fan of long bristles on either side of ninth sternite *exquisita*
 Abdomen often dark without definite contrasting dark spots; male genitalia not as above 2
2. Crossvein r-m beyond middle of discal cell; forceps extended at least half their length beyond lower forceps *leucopogon*
 Crossvein r-m at or before middle of discal cell; male genitalia not as above 3
3. Crossvein r-m at middle of discal cell; ninth abdominal male sternite with medial pencil of white hair-like bristles extended posteriorly *cacopiloga*
 Crossvein r-m before middle of discal cell; forceps of male genitalia with pair of hook-like processes at tips, sternites six through nine increasingly expanded *wilcoxi*

Proctacanthella cacopiloga (Hine) — Distribution state-wide.

Proctacanthella exquisita Osten Sacken — County record: Cimarron.

Proctacanthella leucopogon (Williston) — County records: Beaver, Cimarron, Major, and Texas.

Proctacanthella wilcoxi Bromley — County record: Payne.

Philonicus Loew

1. Wings uniformly reddish *rufipennis*
 Wings fumose *limidipennis*

Philonicus limidipennis (Hine) (Fig. 4) — County records: Caddo, Kiowa, LeFlore, and Tillman.

Philonicus rufipennis Hine (Fig. 3) — County records: Caddo, Carter, Choctaw, Cleveland, Comanche, McCurtain, Payne, Pushmataha, and Sequoyah.

Asilus Linnaeus

1. Wings brown *sericeus*
 Wings hyaline 2
2. Style of third antennal segment very small, one-fourth as long as its segment; femora picine *mesae*
 Style obviously differentiated, about as long as its segment; femora largely reddish 3
3. Scutellum distinctly hairy above with a row of five or more white bristles on posterior margin *delicatulus*
 Scutellum not distinctly hairy above, posterior row scutellar bristles not all white 4

4. Abdomen with bristles laterally before segmental apices *rubicundus*
 Abdomen without bristles beyond the first segment *formosus*

Asilus delicatulus Hine — County record: Ellis.

Asilus formosus Hine — County record: Cimarron.

Asilus mesae (Tucker) — County records: Dewey and Harper.

Asilus rubicundus Hine — County records: Alfalfa, Beaver, Cleveland, Coal, Comanche, Harper, Oklahoma, Payne, Pushmataha, and Texas.

Asilus sericeus Say — County records: Comanche and Craig.

Neotamus Osten Sacken

Neotamus flavofemoratus (Hine) — County records: Caddo, Comanche, Johnston, and Marshall.

Machimus Loew

Machimus griseus Hine — County record: Cimarron.

Tolmerus Loew

1. Femora largely red, at least on the posterior side 2
 Femora entirely black, or black with a preapical red band 4
2. Thoracic bristles yellowish *prairiensis*
 Thoracic bristles black 3
3. Femora almost entirely red *antimachus*
 Femora with largely black, anteriodorsal spot *johnsoni*
4. Femora black with preapical red band, tibiae red with apical and medial dark bands *snowii*
 Femora entirely black 5
5. Upper forceps of male genitalia with tips bent downward, proctiger flattened (Fig. 2) *notatus*
 Upper forceps straight, proctiger angulate at apex (Fig. 1) *virginicus*

Tolmerus antimachus (Walker) — County record: McCurtain.

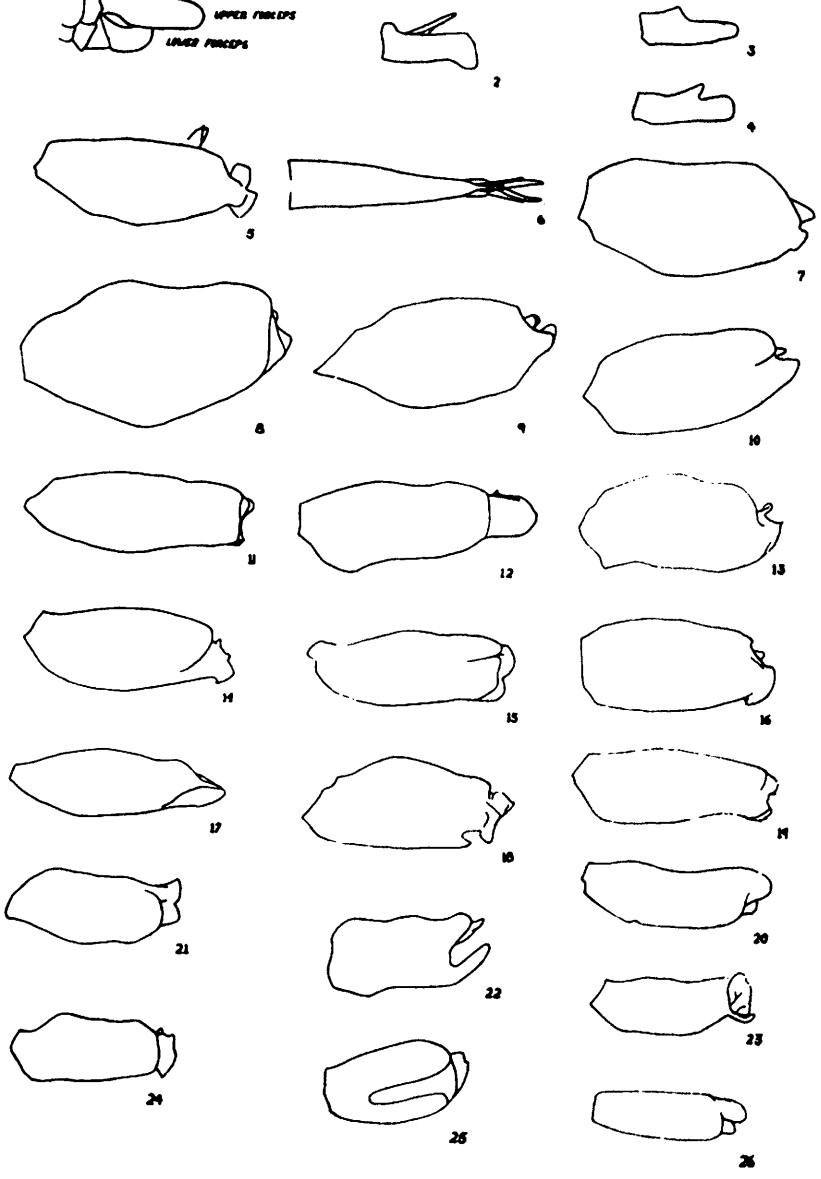
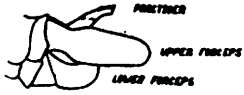
Tolmerus johnsoni (Hine) — County record: Pushmataha.

Tolmerus notatus (Wiedemann) (Fig. 2) — County records: Comanche, Dewey, Haskell, McCurtain, Payne, Pushmataha, and Roger Mills.

Tolmerus prairiensis Tucker — County records: Beaver, Cleveland, Oklahoma, Payne, and Pittsburg.

Tolmerus snowii (Hine) — County records: Bryan, Carter, Choctaw, Cleveland, Delaware, LeFlore, Ottawa, Payne, and Washington.

Tolmerus virginicus (Banks) (Fig. 1) — Banks (1920) erected *Asilus virginicus*, which differed from *T. notatus* (Wiedemann) only in the shape of the male genitalia. No other diagnostic characters or ecological information has been found to separate these similar species and for this reason *virginicus* is assigned to the genus *Tolmerus*. County records: Comanche and McCurtain.



LEGEND FOR FIGURES 1-26

Fig. 1. *Tolmerus virginicus* (Banks), lateral view of hypopygium. Fig. 2. *T. notatus* (Wiedemann), lateral view of upper forceps, proctiger. Fig. 3. *Philonicus rufipennis* (Hine), lateral view of upper forceps (LVUF). Fig. 4. *P. imdidipennis* (Hine), LVUF. Fig. 5. *Efferia bicaudata* (Hine), LVUF and proctiger. Fig. 6. *E. bicaudata* (Hine), dorsal view of ovipositor. Fig. 7. *E. varipes* (Williston), LVUF. Fig. 8. *E. plena* (Hine), LVUF. Fig. 9. *E. nemoralis* (Hine), LVUF. Fig. 10. *E. prairiensis* (Bromley), LVUF. Fig. 11. *E. texana* (Banks), LVUF. Fig. 12. *E. leucocoma* (Williston), LVUF. Fig. 13. *E. auripila* (Hine), LVUF. Fig. 14. *E. candida* Coquillett, LVUF. Fig. 15. *E. argyrosoma* (Hine), LVUF. Fig. 16. *E. snowi* (Hine), LVUF. Fig. 17. *E. bezarensis* (Bromley), LVUF. Fig. 18. *E. aestuans* (Linnaeus), LVUF. Fig. 19. *E. argentifrons* (Hine), LVUF. Fig. 20. *E. belfragei* (Hine), LVUF. Fig. 21. *E. albibarbis* (Macquart), LVUF. Fig. 22. *E. interrupta* (Macquart), LVUF. Fig. 23. *E. tuberculata* (Coquillett), LVUF. Fig. 24. *E. kansensis* (Hine), LVUF. Fig. 25. *E. zonata* (Hine), LVUF. Fig. 26. *E. aurimystacea* (Hine), LVUF.

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